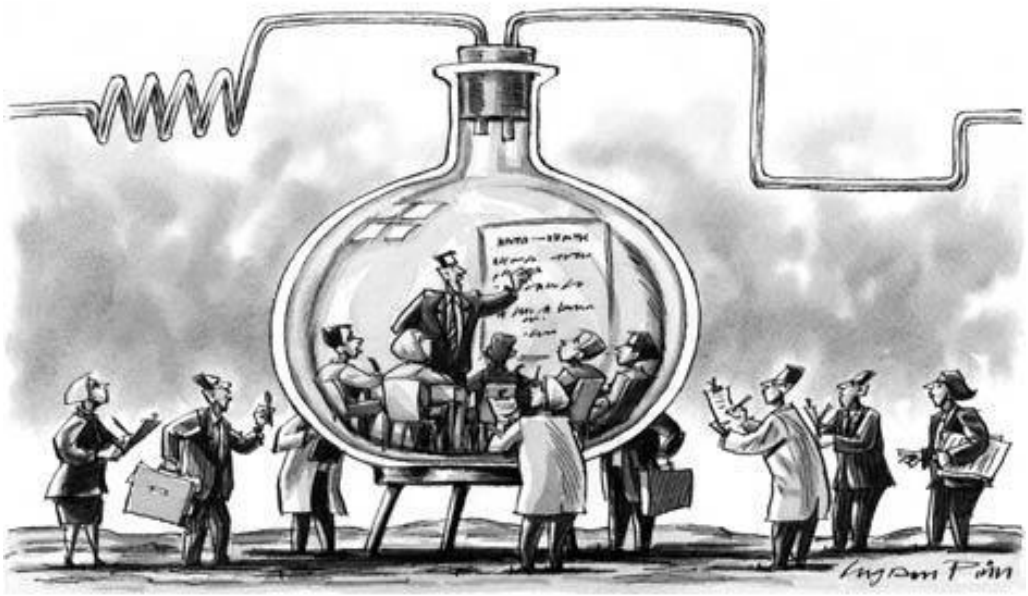
(How) can economic experiments be used to inform EU agricultural policy?



Expert Group on Monitoring and Evaluation on the CAP
DG AGRI, 24 May 2016

Joint Research Centre (JRC-IPTS)
European Commission

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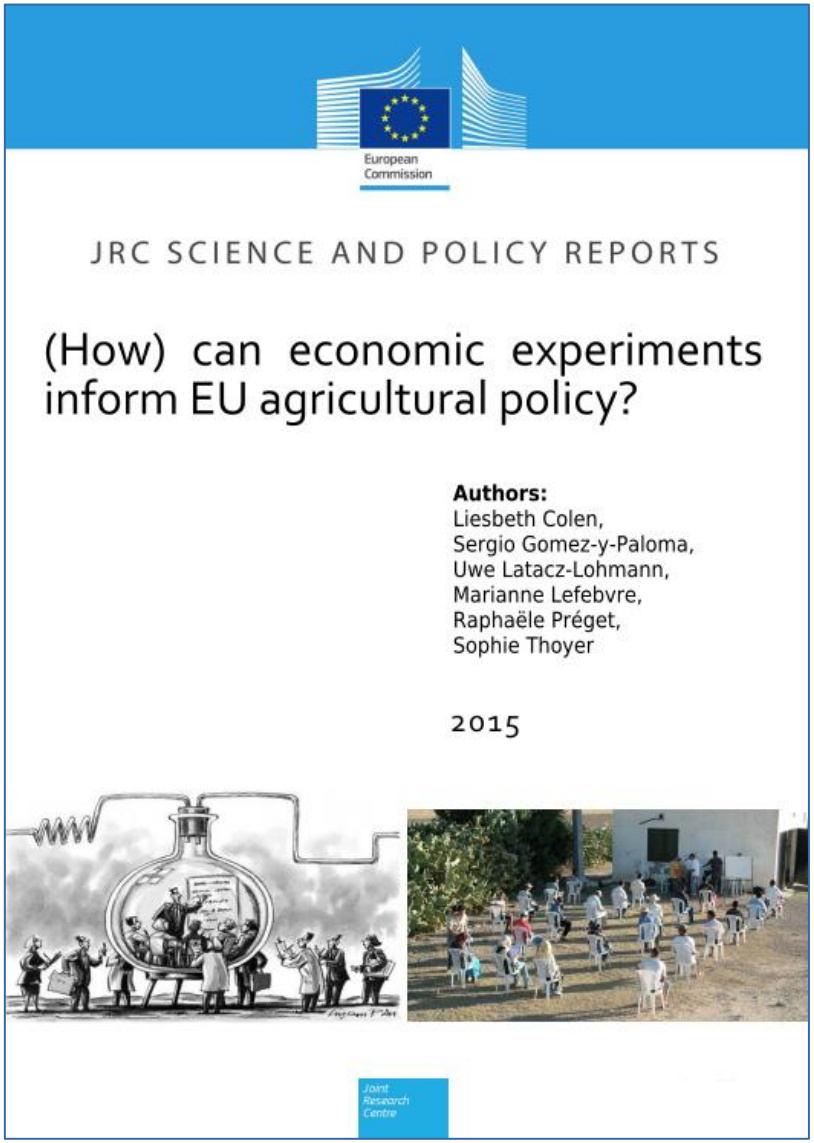


Objectives:

- Inform policy makers and evaluators on the potential (and limitations) of experimental methods
- Promote the integration of experimental methods in the CAP evaluation toolbox

Outline

1. Current evaluation toolbox and new evaluation needs
2. Experimental approaches
   1. Choice experiments
   2. Lab and field experiments
   3. Randomized Controlled Experiments
3. Promote the use of experimental methods

1. Current evaluation toolbox and new evaluation needs

CAP reform and new needs

- Payments targeted at **farm** or even plot level
- Accounting for the **voluntary** nature of measures
- Evaluation and acceptability of **regulatory** measures
- Flexible enough to account for the **heterogeneity** in CAP implementation across Member States and regions.

- Increased attention for careful assessment of the **net impact** of policies

- Recognition of the role of **behavioural** factors in decision making

Current evaluation toolbox and data used

Current evaluation toolbox:

- Simulation models
- Statistical analysis of survey data and econometric techniques to estimate causal impacts (DID, matching, …) accounting for selection bias
- Case studies based on qualitative/quantitative data

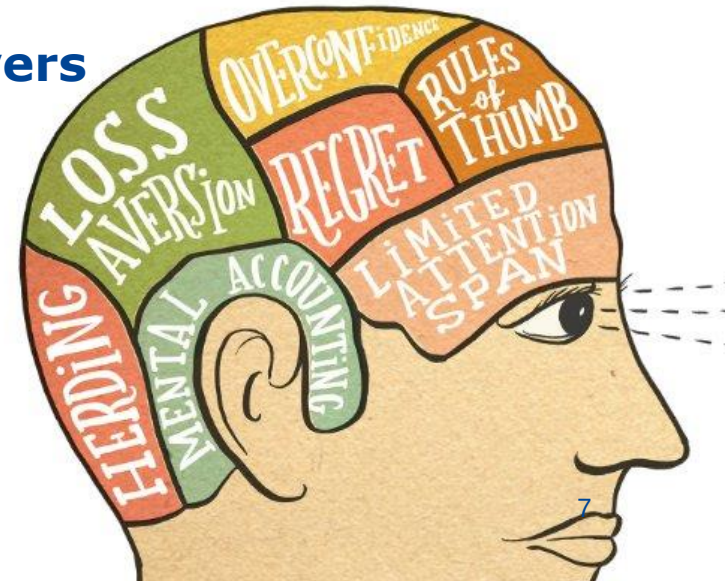
Mostly relying on observational data

- Farm accountancy data network (FADN, DG AGRI)
- Farm Structure Survey (Eurostat)
- Market data from Eurostat, OECD, FAO
- administrative data collected by MS
- qualitative/quantitative information from focus groups or stakeholder interviews)

Potential of experimental methods

Experimental methods seem to be hardly used in agricultural policy evaluation, although

- they generate **new data**
- they can measure the **net causal impact**
- **"**testing is **faster** and **cheaper** in the lab than in the real world"
- they take account of **behavioural drivers**



2. Experimental approaches in existing CAP evaluation studies

1. Choice experiments
2. Lab and field experiments
3. Randomized controlled trials (RCTs)

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2-1. Choice experiments

- Participants are offerered several 'choice sets' of **alternatives** and choose
- Estimates how different factors affect choices made → why?
- Allows estimating Willingness To Pay (WTP) or **Willingness To Accept** (WTA)
- Stated preferences, i.e. **hypothetical** choices
- Can be easily combined with traditional survey

CARD 1 VERSION 1			
	MAIZE SEED A	MAIZE SEED B	
Seed Price			
Yield loss due to Pest			
Seed Type			
Seed Payment	Cash only 	Cash or credit  	Neither Maize Seed A nor Maize Seed B: Given these options, I would prefer to cultivate the seed I now grow.

Example: Greening policy

What is farmers' willingness to accept the new 'greening' requirements? *(Schulz et al., 2014)*

- What factors affect farmers' willingness to comply?
- What are the perceived farm-level costs?

For each choice card, select one alternative:

Attributes	Greening alternative	Opt-out alternative
Ecological Focus Area (EFA)	7% of arable land	Penalty of **€105 per hectare of arable land** No greening provisions
At least 3 crops, each covering no less than …	5% of arable land	
Land counting as EFA	Land enrolled in agri-environmental schemes	
Permissible use of EFA	Leguminous crops may be grown on EFA	
Location of EFA plots	EFA location fixed for 3 years	
I would choose…	✓	✗

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Results:

- Respondents regard greening as a costly constraint
- Not all greening requirements are seen as equally demanding
  - Especially EFA is considered costly, as is the requirement to keep EFA fixed for 3 years
- Not all farmers feel equally affected:
  - E.g. farmers with high opportunity costs of land and high land use intensity are more likely not to comply
- 'Perceived' costs of greening (WTA) > penalty

Factors affecting the probability of choosing to comply with the greening requirements:

… increase in probability

- Higher payment cut
- Legum. crops on EFA permitted **€300/ha legumes**
- Landscape elements count as EFA **€32/ha arable land**

- Full-time farms
- Dairy farm **€83/ha arable land**

… decrease in probability

- Higher share of EFA **€630/ha EFA**
- Location of EFA fixed for 3 years **€286/ha EFA**

- High stocking rates
- High land quality
- Farm with land in env. sensitive area **€39/ha**
- AES participation

Policy implications:

- Need to trade-off the ecological impact of stricter EFA requirements versus risk of lower compliance by farmers
- Fixing the location of the EFA (instead of allowing farmers to choose annually) is costly, so only do this if the land is assigned a high conservation value
- Don’t make EFA tradable if a spatially inclusive distribution of the EFA is considered advantageous
- Allow growing of legumes on EFA land only if judged to yield significant conservation benefits

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Example: Agro-environmental schemes

- What specifications are preferred for a *proposed* AES for cultivating nitrogen-fixing crops (Spain)?
- Why have farmers been less interested in AES with pesticide-free buffer zones than expected (Denmark)? How much land are farmers willing to put under contract?
- Can a collective bonus enhance farmers' enrolment in AES with reduced pesticide use in vineyards (France)? How large must that bonus be?

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2-2. Lab and field experiments

- In the **lab** (often with students)
- In the **field** (with real stakeholders)
- Real-world incentives (they can win/lose money according to their decisions) → reduces strategic bias
- Useful for pre-testing new policies or policy designs
  - e.g. how does behaviour change when rules of a policy is changed, or when permits become tradable, …

Example: income support policies

- Countercyclical payments in US 2002 Farm Act (McIntosh et al., 2007)
  - Lab experiment where students had to allocate acres to crops, some crops being eligible to countercyclical payments (CCP) in a context of price uncertainty
  - Allocation of crops under three policy scenarios: DP /DP + CCP / uncertain policy
  - Result: CCP lead to greater income certainty, less efficient production decisions and higher government payments.

Example: income support policies

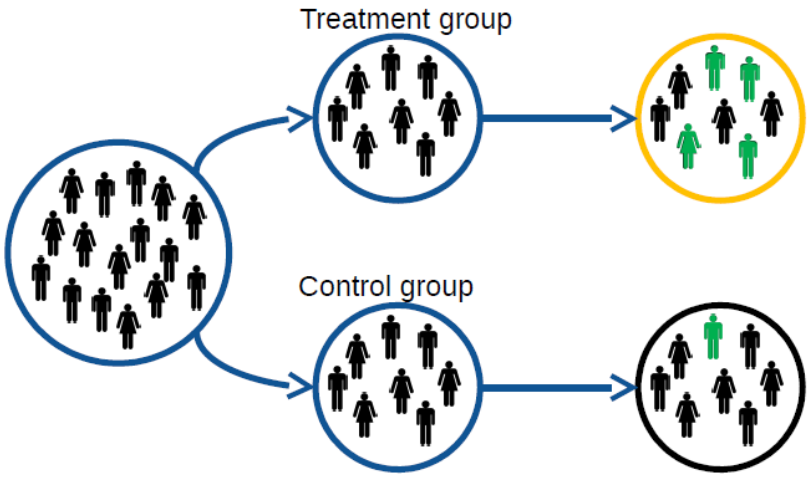
- Trading mechanisms for EU decoupled payment entitlements (Bahrs et al. 2008)
  - Lab experiments with students to provide first insights into effect of trading rules on market outcomes (bilateral trading vs. centralized market institutions)
- Capitalization of subsidies into land rental prices
  - Lab experiments with students and agricultural professionals

Example: agri-environmental policies

- Conservation auctions: conservation contracts with a specified set of management prescriptions are allocated to farmers on the basis of competitive bidding
  - What auction design is the most efficient to pay farmers to suspend irrigation in drought years?
  - Is it a good idea to make payments (partially) depend on the environmental outcome obtained? It increases effort, but participation rate falls.
  - How does imperfect monitoring of farmers' compliance with the contract affects the bidding?

2-3. Randomized Controlled Trials

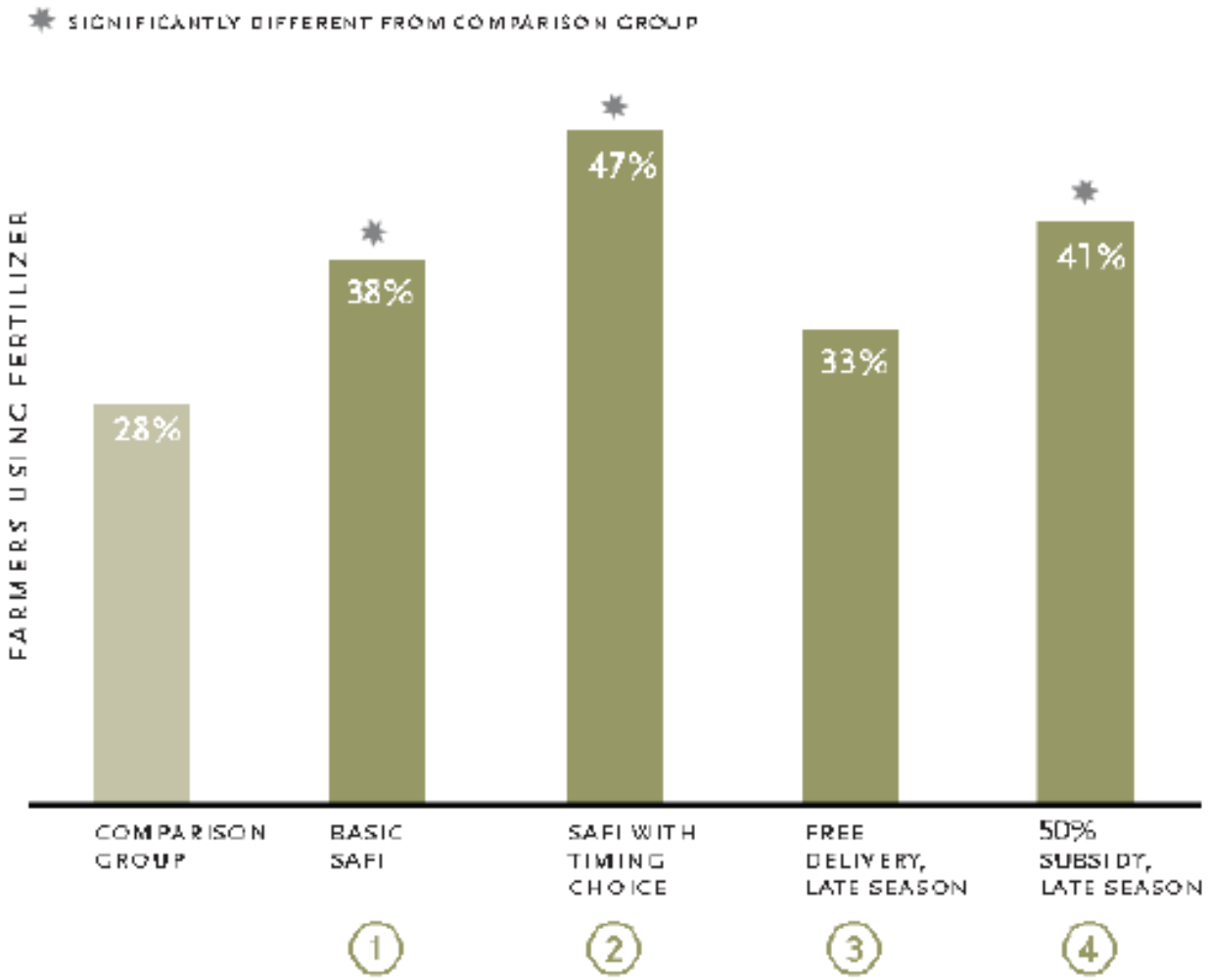
- Participants are **randomly assigned** to a 'treatment' or 'control' group
- 'Treatment' is the **real implementation** of the policy/program
- The control group acts as **counterfactual**
- Random allocations allows to derive the true **causal effect**
- Ethical concerns → "Close-to-random" procedures?



Example: Fertilizer subsidy program

- 'Savings and Fertilizers Initiative' (Kenya): policy to incentivize farmers to buy fertilizers immediately after harvest, when they have cash (Duflo et al., 2011)
  - Why so little fertilizer use in Africa?
  - Time-inconsistent behaviour and impatience: at harvest time, farmers have cash available but are not motivated to buy fertilizer in advance. Later in the season, when fertilizer is needed, no cash is left.
  - Can small, time-limited offers for advanced fertilizer purchase increase fertilizer adoption at lower cost than traditional subsidy program?
  - Five groups of farmers (randomly allocated) : get access to four different types of a fertilizer program + one comparison group

2. Experimental approaches: 2.3 Randomized Controlled Trials



Example: Farmer training

- Farming training program in Armenia
  - **Self-selection** into training programs is problematic to assess its **causal impact**
  - Training was offered to a group of **randomly** selected farmers
  - Results:
    - training did not increase the adoption of improved agricultural practices or changes in cultivation of crops
    - no increase in household income or consumption

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"Close-to-random" experiments

- Randomization as part of a **pilot program**: Randomly offering farmers to participate in a pilot study, while those not participating are the control group
- **Oversubscribed AES**: If more farms want to participate in a program than can be financed, a random choice of who can participate introduces the necessary randomization.
- **Phasing-in** of an AES: the first group of participants can be randomly chosen and, until all participate, the difference between participants and non-participants can be measured.
- **Encouragement design**: A random sample of farms can be targeted by an information campaign to participate in a voluntary AEM.

3. Promote the use of experimental methods

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1. Understand the **needs**
   - Ex-ante vs. ex-post evaluation
   - Small changes in current (design of) policies vs. totally new policies
   - Need to measure the net causal impact
   - Understand *why* a policy is not working as expected
   - Integrate the lessons learned from current policies into next policy cycle

3. Promote the use of experimental methods

2. Make use of the **complementarity** of methodologies
   - e.g. behavioural parameters or elasticities estimated through lab or field experiments can be use to improve simulation models
   - e.g. choice experiments can provide information on expected adoption rates of RDP to be used in models
   - e.g. qualitative interviews identify policy designs to be included in the experiment
   - e.g. first pre-test in the lab with students to select policy designs; then testing different policy-designs with a small group of farmers using a field experiment, before testing the program on a small pilot of randomly selected farmers

3. Promote the use of experimental methods

3. Clarify the need for **representativeness**
   - Are outcomes of the experiment expected to be context-dependent?
   - Experiments can be repeated in different contexts

4. Find responses to **ethical** obstacles associated to randomization
   - Close-to-random experiments?

5. Introduction of innovative methodologies may need **active promotion**
   - Invest in in-house expertise
   - Inform evaluators on the potential of experimental approaches and openness towards the use of these new methods

Questions? More info?

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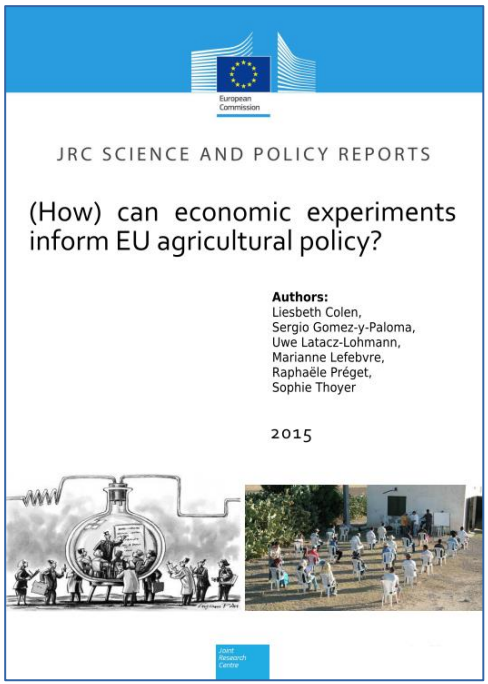
(for more info on the newly launched network of researchers "EU working group Economic experiments for CAP evaluation")



JRC Report: (How) can economic experiments inform EU agricultural policy?

http://publications.jrc.ec.europa.eu/repository/bitstream/JRC97340/jrc%20report%20final.pdf (doi:10.2791/17634)